THE INSTITUTE OF PHYSICS

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BULLETIN

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PHYSICS IN INDUSTRY SERIES

NEW VOLUME

The latest addition to the Institute's Physics in Industry Series will be published on 30th September next. It is *Metallurgical Equilibrium Diagrams*, by W. Hume-Rothery, O.B.E., F.Inst.P., F.R.S., J. W. Christian, M.A., D.Phil., A.Inst.P., and W. B. Pearson, M.A., D.Phil., and runs to 312 pages with 239 figures.

The monograph begins with a theoretical introduction, followed by details of general laboratory technique, and of the different methods of pyrometry. This is followed by a full description of experimental methods for the determination of the liquidus including special chapters on high melting alloys. Similar sections deal with the determination of the solidus, and solid solubility curves, and the use of X-ray methods is described and discussed critically. The final section deals with ternary systems from both the theoretical and experimental viewpoint. The book is fully illustrated and is intended for practising physicists, chemists and metallurgists, and also for final year and post-graduate students of these subjects.

In the last thirty years there have been great advances in the science of alloy structures, and in this work the importance of metallurgical equilibrium diagrams has become increasingly apparent, although no text-book has yet appeared in which the experimental methods have been dealt with in detail. The present monograph fills this gap, and gives a comprehensive and critical account of the experimental methods involved, together with full experimental details of many techniques.

The Oxford School of Metallurgists, in which this book was written, has done much to advance the science of alloy structures; and the authors have personal experience of many of the methods described.

The published price is £2 10s. 0d. but members of any grade in the Institute are entitled to one copy each for their *personal* use at £1 17s. 6d.

Orders should be sent to the Institute on the enclosed form, accompanied by a remittance.

THE GRADUATESHIP EXAMINATION, 1952

The Institute's Graduateship Examination was held this year for the first time. The examination centres were London (at the Institute's House) and Wigan (at the Mining and Technical College); the practical examination was held at The Polytechnic, Regent Street, London.

Twenty-four candidates were accepted by the Examiners for the 1952 examination, but three candidates subsequently requested the transfer of their entries to 1953. Most of the candidates already held a degree or Higher National Certificate in Applied Physics and were granted substantial exemption. Six candidates, whose names are given below, satisfied the Examiners in all the papers they were required to take and are deemed to comply with the academic requirements for Graduateship or corporate membership of the Institute.

The Examiners were disappointed with the general standard reached by the candidates; in particular, there appeared to be a lack of knowledge of basic physics.

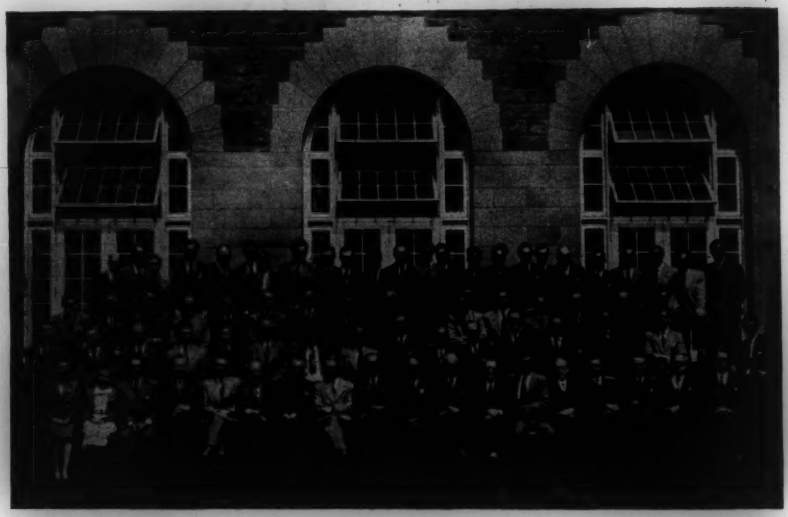
The Examiners were Professor A. M. Tyndall, Professor F. A. Vick, Mr. A. E. de Barr and Dr. J. Topping, together with Mr. J. Yarwood for the practical examination.

The following candidates satisfied the Examiners:

J. H. Garrett.
R. H. Hardcastle.
W. M. Morley.
A. J. Stacey.
A. A. Tarnowski.
E. D. Tolmie.

INDUSTRIAL RADIOLOGY GROUP

Summer Meeting 1952



The 1952 Summer Meeting of the Industrial Radiology Group was held at Crewe Hall, Sheffield, on 3rd to 5th July. The attendance varied from about 80 to 100, including about 40 resident visitors. The first session consisted of a discussion on the training of industrial radiographers. Mr. J. C. Rockley (A.I.D. Harefield) outlined a scheme which had been prepared by a Sub-Committee of the Group for a part-time course of training in technical colleges. He said that on the recommendation of The Institute of Physics an exploratory committee had been set up by the City and Guilds of London Institute to examine the question. Mr. J. D. Hislop (Solus-Schall Ltd.) read a paper in which he indicated that the proposed scheme would have the support not only of industrialists but also of the makers of radiological equipment. Both speakers emphasized the need for training not only in radiographic techniques but also in the interpretation of results and in the writing of reports. The discussion was opened by Professor J. K. Robertson (Kingston University, Canada) who referred to the degree courses in engineering physics which were proving very successful in Canada. He stressed the importance of a sound basis of fundamental physics for a course on the applications of radiology to engineering and metallurgy. There was a lively discussion in which there was considerable difference of opinion as to the general standard of education necessary before a student could benefit from a specialized course of training.

In the afternoon Dr. R. Jackson (British Coal Utilization Research Association) read a paper on "The presentation of results in radiography," in which he dealt mainly with the proposals of a B.S.I. Committee for the standardization of terminology of defects in castings. It was evident that after several years' work there was still not unanimity, but the opinion of the meeting was that the standard should be published, subject to revision subsequently as found necessary. A paper on "Economic aspects and administration of an industrial radiology department," by E. W. Colbeck, F. Cousans, J. R. Rait and H. S. Peiser (all of Hadfields Ltd.), was read by Mr. Peiser. Many examples were given of the way in which radiographic examination had been of value to the Foundry Department of the firm.

In the evening of 3rd July there was a reception and dinner at the Hall. This was attended by a number of guests from academic and industrial circles in Sheffield. After dinner an address was given from Dr. O. Vaupel (Röntgenstelle Material Prufungsamt, Berlin) on "The standardization of radiology in Germany." He spoke about standards for the quality control of welds and castings, and of penetrameters, and went on to describe the standardization of magnetic methods of crack detection, and of magnetic inks. Of special interest was a magnetic "penetrameter" devised by R. Berthold to indicate the efficiency of magnetization. The evening's proceedings concluded with a social in which a very entertaining feature was a burlesque of a B.S.I. Committee in session, produced by Mr. J. F. Hinsley and his associates.

The session on Friday commenced with the Group Annual General Meeting, after which a paper on "The radiography of castings" was read by Mr. J. F. Hinsley (Edgar Allen & Co. Ltd.). This talk was based on a chapter which he was

contributing to the forthcoming *Second Handbook of Industrial Radiology* now in preparation for The Institute of Physics. He described various ways of making castings, and the terminology of foundry practice, showing how radiographic examination could be used to help in the development of foundry techniques. Mr. G. T. Harris (Research Manager, William Jessop & Sons Ltd.) then read a paper on "Non-destructive testing in a steel works." He began with methods of identification such as spectrographic analysis and also referred to the many methods of checking mechanical and physical properties; these included thermo-electric and tribo-electric methods. Various methods of checking dimensional accuracy were described, including automatic thickness gauges. For the detection of surface defects such as cracks there were now, in addition to the well-known magnetic method, much improved penetrant oil methods such as the American "Dy-chek" process. By far the most sensitive method, however, and the one which, in his experience, was most widely used, was electrolytic etching. Mr. Harris considered that much more research was urgently needed to make practicable the ultrasonic examination of steel castings. He also referred briefly to the need to extend the range of thickness which could be examined by X-rays, and to the newer developments of xero-radiography, and the use of image converters for the amplification of X-ray beams.

On Friday afternoon visits were paid to the research laboratories of Thos. Firth and John Brown Ltd. (by courtesy of Dr. C. Sykes), Edgar Allen & Co. (by courtesy of Dr. E. Gregory) and Hadfields Ltd. (by courtesy of the Directors). The day ended with a motor drive into Derbyshire, dinner at Baslow, and a visit to the Treak Hill Cavern at Castleton.

On Saturday morning, by invitation of the Inspector of Naval Ordnance (Capt. F. T. Boswell, R.N.), a visit was paid to the Norton Laboratories. This concluded a highly successful meeting for which much credit is due to the Provincial Sub-Committee for the arrangements, and in particular to Mr. J. F. Hinsley and Mr. H. S. Peiser. Acknowledgement is also made of the help given by those who loaned apparatus and exhibits.

C. CROXSON

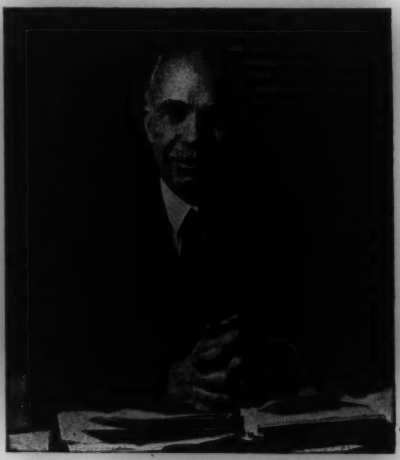
MEMBER OF NOTE

Sir (William) Lawrence Bragg, O.B.E., M.C., M.A., D.Sc., F.R.S. (*Past-President*). Perhaps the most widely known living British physicist, Sir Lawrence Bragg was born in Adelaide, South Australia, in 1890 while his father, the late Sir William Bragg, O.M., was a Professor in the University of Adelaide. Sir Lawrence was educated at St. Peter's College, Adelaide, the University of Adelaide and Trinity College, Cambridge, becoming a Fellow of Trinity College in 1914. The following year he and his father jointly received the award of the Nobel Prize for physics, in recognition of their outstanding work on the application of X-rays to the study of crystal structure. For the next four years he was attached to the G.H.Q. in France as technical adviser on sound ranging.

In 1919 when Rutherford moved to Cambridge as Cavendish Professor, Sir Lawrence (at the age of 29) was appointed his successor as Langworthy Professor of Physics in the University of Manchester and he remained there for eighteen years. He was appointed Director of the National Physical Laboratory in 1937 but left the post a year later when, on Rutherford's death, he became Cavendish Professor of Experimental Physics in the University of Cambridge.

The contributions to physics, particularly to crystallography, of Sir Lawrence and his research schools at Manchester and Cambridge have had world-wide recognition. He was elected F.R.S. in 1921 and has received a Royal Medal (1946) and the Hughes Medal (1931) of the Royal Society; he has been honoured by foreign academies and has received honorary degrees of ten universities. He was knighted in 1941.

A Founder Fellow of the Institute, Sir Lawrence served on the Board from 1931 to 1934 and again, as a Vice-President, from 1934 to 1938. In 1939 he was elected President and



continued to serve until 1943 (his father had been President from 1925 to 1927). He has been particularly closely connected during the past ten years with the Institute's X-ray Analysis Group but he has at all times been willing to give help and advice on any matter arising from the Institute's work.

An elliptic orbit is correct only to a first very close approximation; it does not fit the facts exactly. What if Kepler could have used a modern calculating machine? I believe he never would have ventured to formulate his laws.

E. T. BELL.

APPOINTMENTS VACANT

The inclusion of particulars of a vacancy must not be taken to imply that the Institute necessarily approves of the terms offered or that might be offered. Candidates should satisfy themselves that these are satisfactory, and they may always refer to the Institute for advice.

The Shell Refining and Marketing Co. Ltd. have openings at Stanlow Refinery, Ellesmere Port, Cheshire, for:

(1) **Physicists** who are required for instrument development work. Candidates must possess 1st or 2nd class honours degree in physics and should be interested in the development and application of new types of instruments to plant control. Post-graduate experience desirable but not essential.

(2) **Physicists** or **Physical Chemists** for technological work. Candidates must possess 1st or 2nd class honours degree in physics or chemistry and if in latter subject they should have specialized in surface and colloidal behaviour. Post-graduate experience desirable but not essential.

Commencing salary would be according to qualifications and experience. Pension fund. Fuller details given at interview for which travelling expenses paid.

Write first instance giving full particulars, qualifications, age, experience and post applied for in the case of (1) to Box Z.P.314, Deacons Advertising; (2) to Box Z.Q.315, Deacon's Advertising at 36, Leadenhall Street, London, E.C.3.

Assistant Lecturer in Chemical Engineering. The Governing Body invites applications for an Assistant Lectureship in Chemical Engineering in the College of Technology, Manchester, with the title and status of Assistant Lecturer in the University of Manchester. Candidates should be graduates in chemical engineering, physics or mathematics, and will be required to undertake work in hydrodynamic problems of chemical engineering. Salary: £500 per annum, rising by annual increments of £25 to £600 per annum. Commencing salary according to qualifications. Conditions of appointment and form of application may be obtained from The Registrar, **College of Technology, Manchester 1.** The last day for the receipt of applications is 17 *September*, 1952. Canvassing, either directly or indirectly, will disqualify a candidate for appointment.

Applications are invited by the **Ministry of Supply** from **Physicists** for the following appointment in the Experimental Officer class at an Establishment at Aldermaston, Berkshire. **Physicist** with experience of X-ray diffraction. Some knowledge and experience of electron diffraction and electron microscopy would be an advantage. Ref. A 219/52A. Minimum qualification required is a Higher School Certificate with physics as a principal subject, but other qualifications, e.g. Higher National Certificate or a degree, may be an advantage. Appointment will be made in one of the following grades according to age, qualifications and experience: Experimental Officer (minimum age 26 years), £597–£754 per annum, male; Assistant Experimental Officer (minimum age 18 years), £264–£555 per annum, male. Rates for women are somewhat lower. The posts are unestablished. Application forms are obtainable from Ministry of Labour and National Service, Technical and Scientific Register (K), Almack House, 26, King Street, London, S.W. 1, quoting reference number.

Nelson Research Laboratories, **English Electric Co. Ltd.**, Stafford, have a vacancy for a **Senior Physicist** for work on magnetic materials chiefly in connection with the application of the latest ideas to soft ferromagnetics. Applicants should have a good honours degree and at least four years' industrial or academic research experience. This is a most interesting vacancy in this field, and offers ample scope for advancement. Please write, giving full details and quoting reference 310B, to Central Personnel Services, English Electric Co. Ltd., 24–30, Gillingham Street, London, S.W.1.

Northampton Polytechnic, St. John Street, E.C.1.. Applications are invited for vacancy on full-time lecturing staff of the Department of Applied Physics. Candidates should possess a university degree in physics. Salary in accordance with the London Technical Burnham Scale Grade A, viz. £415 by £18 to £670, with allowance of £60 for graduates or equivalent and up to £54 for training, plus London allowance of £36 (£48 if over 37). Particulars and form of application from Secretary.

Graduate Physicist required for metal physics work utilizing X-rays, including Geiger-counter and high temperature techniques. Previous experience not essential. Salary in accordance with age, experience and qualifications. Applications should be made to Director of Research, **G.K.N. Group Research Laboratory,** Manor Works, Ettingshall, Wolverhampton.

Physicist required for responsible work in the physics section on metal physics and general physical problems. Honours graduate with several years' research experience preferred. Salary in accordance with age, experience and qualifications. Applications should be made to Director of Research, **G.K.N. Group Research Laboratory,** Manor Works, Ettingshall, Wolverhampton.

Applications are invited for a senior position in a materials research laboratory for work on certain aspects of metallurgy. A background of related physics would be an asset, as the work is partly concerned with the properties of metal and non-metal alloys in respect of their electrical properties.

Apply in the first instance to the Personnel Manager, **Standard Telecommunications Laboratories Ltd.,** Progress Way, Enfield, Middlesex.

PHYSICAL SOCIETY MEETINGS

Members of all grades of the Institute are invited to attend the following meetings of the Physical Society or its Groups. As a matter of courtesy, notification of intention to attend should be sent in advance to the Secretary-Editor, Physical Society, 1, Lowther Gardens, Prince Consort Road, S.W.7, to whom also should be addressed enquiries concerning meetings of which full details are not given below.

Date and Time	*Subject*	*Lecturer or Organizer*	*Place of Meeting*	*Society or Group*
Oct. 3rd 5 p.m.	The atomic nucleus and its constituents (Rutherford Lecture)	Prof. R. E. Peierls	London	Society
Oct. 13th 5 p.m.	The American acoustical scene	Mr. A. T. Pickles	Science Museum, London	Acoustics Group
Oct. 16th 5.30 p.m.	Compressor design and characteristics	Dr. A. J. Baruarel	Science Museum, London	Low Temperature Group
Oct. 29th 5 p.m.	The stationary waves in the space lattice of crystals and their experimental proof	Prof. M. von Laue	London	Society
Nov. 4th 5.30 p.m.	The threshold of hearing		Imperial College, London	Acoustics Group

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